

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
30 June 2005 (30.06.2005)

PCT

(10) International Publication Number  
**WO 2005/059707 A3**

(51) International Patent Classification<sup>7</sup>: **G01N 33/48**

(21) International Application Number:  
PCT/US2004/042027

(22) International Filing Date:  
13 December 2004 (13.12.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/529,146 12 December 2003 (12.12.2003) US

(71) Applicants (for all designated States except US): **GNI LTD.** [JP/JP]; Toshi-ikusei Building 3F, Shibuya 3-29-22, Shibuya-Ku, Tokyo 150-0002 (JP). **GNI USA** [US/US]; 560 South Winchester Boulevard, Suite 500, San Jose, California 95128 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **OTT, Sascha** [JP/JP]; 9-24-7 Seijou, Setagaya-ku, Tokyo 157-0066 (JP). **MIYANO, Satoru** [JP/JP]; 4-8-1-602 Kamitakada, Nakano, Tokyo 164-0002 (JP).

(74) Agents: **BORSON, Benjamin, D.** et al.; Fliesler Meyer LLP, Four Embarcadero Center, Fourth Floor, San Francisco, CA 94111-4156 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:  
12 January 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ESTIMATING GENE NETWORKS USING INFERENCE METHODS AND BIOLOGICAL CONSTRAINTS

(57) Abstract: The accurate estimation of gene networks from gene expression measurements is a major challenge in the field of Bioinformatics. We present a general approach to reduce the search space to a biologically meaningful subspace and to find optimal solutions within the subspace in linear time by using inferential models constrained by biologically relevant information. We showed the effectiveness of this approach in application to yeast and *Bacillus subtilis* data. Also, we provide systems and storage media adapted to provide and store data and results of gene network relationships.



WO 2005/059707 A3